PEER REVIEW

- PRESENTATION TO: NRC WATER SCIENCE AND TECHNOLOGY BOARD

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OUTLINE

- RESOURCES
- DEFINITION
- PURPOSE
- TYPES
- PRINCIPLES
- PROBLEMS
- MECHANICS
- CONCLUSIONS

RESOURCES

- PHILOSOPHY/ PRINCIPLES/ EXAMPLES (1997)
- http://www.dtic.mil/dtic/kostoff/index.html
- ***RESEARCH PROGRAM PEER REVIEW***

- MECHANICS (1998)
- http://www.sciquest.com/cgi-bin/ncommerce3/ExecMacro/sci_kostoff2.d2w/report?nav_banner=special&Tmstmp=25884
- ***GPRA SCIENCE AND TECHNOLOGY PEER REVIEW***

- UPDATED PRINCIPLES/ MECHANICS (2001)
- (INFORMATION TECHNOLOGY ENHANCEMENTS)
- http://www.onr.navy.mil/sci_tech/special/technowatch/
- PUBLICATIONS; RESEARCH EVALUATION; PEER REVIEW
- ***NETWORK-CENTRIC PEER REVIEW***

DEFINITION

- REVIEW OF A PERSON OR PERSONS BY OTHERS OF EQUAL STANDING

- http://www.onr.navy.mil/sci_tech/special/technowatch/
- PUBLICATIONS; RESEARCH EVALUATION; PEER REVIEW
- ***NETWORK-CENTRIC PEER REVIEW***

PURPOSE

- IMPROVE RESOURCE ALLOCATION
- PROMOTE ACCOUNTABILITY
- MEASURE PERFORMANCE
- SUPPORTS POLICYMAKERS' DECISIONS

TYPES

- PROGRAM
- PROJECT
- PROPOSAL
- MANUSCRIPT
- TENURE

PRINCIPLES

- SENIOR MANAGEMENT COMMITMENT TO HIGHEST QUALITY REVIEW

PRINCIPLES (CONT'D)

- EVALUATION MANAGER MOTIVATION
  - SETS BOUNDARY CONDITIONS ON SCOPE
  - SELECTS EVALUATION TECHNIQUES USED
  - SELECTS EXPERTS

PRINCIPLES (CONT'D)

- STATEMENT OF IMPORTANCE
  - UNAMBIGUOUS STATEMENT OF OBJECTIVES CRITICAL
  - STATEMENT OF POTENTIAL REVIEW IMPACT CRITICAL
  - REVIEW WITHOUT CONSEQUENCES/ ACTIONS USELESS

PRINCIPLES (CONT'D)

- COMPETENCY OF EVALUATORS
  - COMPETENCY IN SPECIFIC APPROACHES PRESENTED ('JOB RIGHT')
  - COMPETENCY TO ADDRESS BROAD OBJECTIVES ('RIGHT JOB')

PRINCIPLES (CONT'D)

- RELEVANCE OF EVALUATION CRITERIA TO FUTURE ACTION
- **EVERY S&T METRIC, AND ASSOCIATED DATA, PRESENTED IN A STUDY OR BRIEFING SHOULD HAVE A DECISION FOCUS; IT SHOULD CONTRIBUTE TO THE ANSWER OF A QUESTION THAT IN TURN WOULD BE THE BASIS OF A RECOMMENDATION FOR FUTURE ACTION.**

PRINCIPLES (CONT'D)

- INTEGRATION
  - PART OF STRATEGIC MANAGEMENT PROCESS
  - OBJECTIVES ---> METRICS ---> DATA
  - INTEGRATION WITH OTHER MANAGEMENT DECISION AIDS CRITICAL

PRINCIPLES (CONT'D)

- NORMALIZATION ACROSS TECHNICAL DISCIPLINES
  - COMMON PANEL MEMBERS USEFUL
  - ALLOWANCES IN EVALUATION SCORES FOR DISCIPLINE UNIQUENESS

PRINCIPLES (CONT'D)

- SELECTION OF EVALUATION CRITERIA
  - STRONGLY OBJECTIVES DEPENDENT
  - RESEARCH QUALITY/ MISSION RELEVANCE

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PRINCIPLES (CONT'D)

- SELECTION OF EVALUATION CRITERIA (CONT'D)
  - RESEARCH QUALITY
    - RESEARCH MERIT
    - RESEARCH APPROACH
    - TEAM QUALITY
    - BALANCE BETWEEN RESOURCES AND OBJECTIVES

PRINCIPLES (CONT'D)

- SELECTION OF EVALUATION CRITERIA (CONT'D)
  - MISSION RELEVANCE
    - POTENTIAL FOR TRANSITION/ UTILITY
    - POTENTIAL FOR LONG-TERM IMPACT
    - APPROPRIATENESS FOR SPONSOR

PRINCIPLES (CONT'D)

- EVALUATION RELIABILITY
  - REPEATABILITY WITH DIFFERENT PANEL
  - REPRESENTATIVE COMMUNITY PARTICIPATION REQUIRED

PRINCIPLES (CONT'D)

- GLOBAL DATA AWARENESS
  - AVOID DUPLICATION
  - EXPLOIT/ LEVERAGE RESEARCH
  - POTENTIAL TRANSITIONS

PRINCIPLES (CONT'D)

- SECRECY
  - FEW REWARDS FOR CRITICAL OPINIONS
  - IMPORTANT FOR FRANK OPINIONS

PRINCIPLES (CONT'D)

- NON-NEGLIGIBLE COSTS
  - TIME OF HIGH QUALITY REVIEWERS MAJOR DRIVER
  - PREPARATION TIME FOR REVIEWEES ALSO HIGH

PROBLEMS

- REVIEWER BIAS
- TIME CONSUMING
  - PROGRAM REVIEW PREPARATION
  - PROPOSAL COMPETITION
- DIFFERENT REVIEWER INTERPRETATIONS
- APPLICABILITY TO PROPOSED RESEARCH UNCERTAIN
- CONSERVATIVE BIAS

MECHANICS

- PROGRAM REVIEWS
  - FRONT END
    - OVERVIEW/ INVESTMENT STRATEGY
  - BACK END
    - DETAILED TECHNICAL PRESENTATIONS
  - INVESTMENT STRATEGY WEAKEST LINK
  - DETAILED TECHNICAL PRESENTATIONS STRONGEST LINK

  - http://www.sciquest.com/cgi-bin/ncommerce3/ExecMacro/sci_kostoff2.d2w/report?nav_banner=special&Tmstmp=25884
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MECHANICS (CONT'D)

- FRONT END
  - MISSION STATEMENT
    - ORGANIZATION'S CHARTER
    - DEFINES SCOPE, BOUNDARIES, NICHE
    - CAPABILITIES/ TECHNOLOGIES/ PROGRAMS NOT ADDRESSED

MECHANICS (CONT'D)

- FRONT END (CONT'D)
  - VISION
    - PICTURE OR SCHEMATIC OF DESIRED FUTURE
    - GENERIC CAPABILITIES DESIRED
    - DOES NOT ADDRESS APPROACH; ONLY END TARGETS

MECHANICS (CONT'D)

- FRONT END (CONT'D)
  - STATE-OF-ART
    - EXISTING CAPABILITIES FOR ACHIEVING VISION

MECHANICS (CONT'D)

- FRONT END
  - CHALLENGES
    - IMPROVEMENT IN STATE-OF-ART REQUIRED TO ACHIEVE VISION
    - ROADBLOCKS/ BARRIERS TO BE OVERCOME
    - UNIQUE ENVIRONMENTAL/ OPERATIONAL CONSIDERATIONS

MECHANICS (CONT'D)

- FRONT END
  - PROGRAM/ APPROACH
    - PROJECTS AND FUNDING NEEDED TO CLOSE GAP BETWEEN STATE-OF-ART AND VISION
    - SHOW RELATION TO REQUIREMENTS/ OBJECTIVES

CONCLUSIONS

- BEST EVALUATION PROCESS
- NEEDS INTEGRATIONWITH OTHER MANAGEMENT DECISION AIDS
- NEEDS INTEGRATION WITH STRATEGIC MANAGEMENT PROCESS
- REVIEWER BIAS PROBLEMMATICAL
- TIME CONSUMING PROCESS
- INVESTMENT STRATEGY MOST IMPORTANT